Nov.6,1978

Since this is the 'premier' issue in the subscriber format,I thought
a few words about myself would be in order. Right off, I'm not the best
typist, so bear with me. My interest in computers lies in the hobby-home
area, with 110v AC control, lists, conference calling, and such being of
prime concern. I work for Lockheed Missiles & Space Co, doing interface
engineering, which is a four dollar word for making sure things go together.
I have access to a Tektronix 4051, a basic language desktop unit with lots
of capability and off-line accessories.My other hobby pursuits lie in model
railroading, N scale using heavy electric locos, and a collection of high-
performance radio receivers, epitomized by E.H.Scott radios. As a ham, I
have some knowledge of electronics, and am self-tought in the area of
computers. Icertainly don't understand all I know, and am acting as a
reporter in this Arcadian endeavor.

FORMAT will settle down after a while, right now it will be somewhat
mixed up.

SUPPLIER of Bally equipment in Ohio is DigiTrends, Inc. located at
1813 E. 12 St. Cleveland 44114, who tell me they plan to be a compre-
hensive source.

FOOTBALL cartridge is now going into production. It takes 6 - 12 weeks
for the chips to be produced, so they may be out by the holidays.

ADD-ON will be on display at the Las Vegas electronics show in January,
It is planned to have the unit working with a disc memory and with a
printer at the show, but there is also a rumor that the mass memory
device will be a cassette-loaded RAM.

BALLY is taking the novel approach (at least in the hobby computing
industry) of planning to identify what non-Bally equipment will work
with the base units, with little or no modification. Any such discoveries
on your part may be mutually beneficial.

DESIRES by correspondents are listed below. There are a few things that
will take a lot of work, but eventually... If you can help out in any of
these work areas, we can set up a project system and publicize the efforts
of a team that would result.   These are in no particular order.
       voice control   direct TV entry   RS 232 interface
       telephone modem   video tape recorder control for storage
       TTY interface   chess games   interactive games
       computer conferencing   word processing
       direct 'toy organ' keyboard entry

JS&A has not shipped any hardware lately. What has been shipped is a pair
of letters to their mailing lists, one to owners of the basic unit and the
other to those still waiting. A copy of each is enclosed for your info.

This is a copy of the letter that was sent to those who have yet to receive the machine:

JS&A NATIONAL SALES GROUP
One JS&A Plaza Northbrook, Illinois 60062
(312) 564-9000 Telex:72-4498
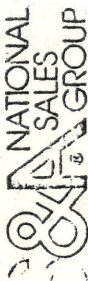
Dear Customer:

As you are well aware, there has been a delay in the shipment of your Bally unit.

The delays have been caused by almost every problem imaginable and have lasted almost one year now. Bally, however, is now in full production, and there appears to be no production problems.

In addition to the delays, there are serious doubts in our mind as to whether Bally will produce the add-on module we referred to in our advertisements.

Bally refuses to make a commitment to us to produce the add-on module, and they indicate that if they do proceed with the system, it won't be until June, 1979 when their unit will be available. Even the cost of the system is yet undetermined but is estimated to be around $600—well above the price they led us to believe the unit would cost.

Bally feels 90% positive that they will complete their commitment to us despite their reluctance to sign a definitive agreement. JS&A, on the other hand, refuses to continue a business relationship with them without the positive assurances that the add-on module will indeed be produced soon.

Every fact presented in our advertising literature was verified by the Bally organization prior to its publication. We tried our best to offer what, in our opinion, was the best product of its kind on the market, but the Bally organization let us down.

In the course of trying to get a commitment from Bally, JS&A was approached by a major US Corporation whose name is more recognizable than Bally's. The company has come up with a similar concept to Bally's using a two part system—part A similar to the basic Bally unit and part B similar to the add-on module.

The part A has been developed and FCC approved. Part B will be ready in February. We feel that their part A far exceeds Bally's basic unit and that their part B will be very similar to Bally's add-on module. Prices are quite competitive to Bally's prices.

This major Corporation has asked us to keep their name confidential until we are ready to introduce their product nationally sometime in January. We feel a great deal of confidence that the new unit will be right on time as we have already been given firm commitments as to delivery—something we have yet been unable to do with Bally.

Prior to our national introduction, we wish to give you the opportunity to select the new unit which, in our opinion, has several advantages over the Bally unit.

We will hold your order and advise you in December, prior to our national announcement. We will offer you, in advance of our introduction, the opportunity to purchase the new unit at a price below what we intend to offer it nationally, and we feel confident that our promises to you will be backed by a very responsible and competent manufacturer.

If, when the new unit is announced, you would rather purchase the Bally unit, we will be happy to supply it to you but without a firm commitment to supply the add-on module from Bally.

In either case, we are indeed sorry for the delay and inconvenience caused you. Enclosed is a questionnaire and postage-paid reply envelope so you may express your decision to us regarding our offer. We would appreciate it if you would fill out the questionnaire and return it in the enclosed envelope so we may determine your intentions. Again, thank you for your patience.

Sincerely,

JS&A NATIONAL SALES GROUP

William Mitchell
Group Marketing Director

WM/ms

This is a copy of the letter that was sent to previous recipients of the machine:

JS&A NATIONAL SALES GROUP

One JS&A Plaza, Northbrook, Illinois 60062

(312) 564-9000 Telex:72-4498

OCT 16 1979

Dear Customer:

We trust you have your Bally Home Library Computer and have found it quite satisfactory.

Very shortly, Bally will be releasing some of their new game cartridges and educational programs, and we plan to advise you of those upon their release.

You've no doubt realized that practically the entire Bally program has been delayed. The problems with production, FCC approval delays, and late delivery of parts are past and we don't want to rehash history.

We clearly made a mistake by offering the basic unit in advance of seeing an actual production model. And quite frankly, we've never experienced a backorder problem like the one we've had with this unit.

Because of this bad experience with the Bally unit, we have been quite concerned with Bally's future plans concerning the add-on module. To assure our customers of a reasonable delivery date, we requested, long ago, that Bally supply us with a firm commitment to supply us with the add-on module along with its final price and features.

The delays in the basic unit caused Bally to delay any commitment to produce the add-on module for us. We have therefore taken the position with Bally that if they do not produce the unit, they permit us to manufacture it ourselves to assure our customers of our commitments to them. Bally has agreed and we are presently working out a final agreement in this regard.

Bally has reassured us that although they are not willing to make a firm commitment to us, they do feel 90% confident that they will definitely go through with the production of the unit. However, they have further advised us that:

1) The add-on module will not be available until June of next year.

2) The cost will be higher than they led us to believe—probably around $600.

3) The unit will have more features than was originally proposed.

The purpose of this letter is to advise you of the circumstances regarding the delay of the add-on module and the information that we have been receiving from Bally.

We were told by Bally representatives that all the statements we made in our advertisements were correct. Because of delays and (in our opinion) inexperience on their part, they have obviously let us down. We feel it our obligation to advise you and question your interest in the add-on module.

It is not our intention to get into a legal battle with Bally. We feel that by cooperating with them, in the event that they do not produce the add-on module, we can still protect our customers' interests by producing the unit ourselves.

When the unit is available, because of its higher price, we will discount it as low as possible to provide the unit to you at the price we originally quoted you or as close to it as possible. And we will do all we can to advance the June delivery date.

We have already seen a working prototype of the add-on module. We fully intend to sell it and Bally feels that they will proceed, but we also felt it our obligation to advise you of the reason for the delays and to give you a true picture of the events surrounding this matter.

We need your commitment to us regarding your desire to purchase the add-on module so that we may reserve production time with Bally. Would you please jot down the answers to the questions listed and return them in the postage paid return envelope. If no answer is received, we will assume that you are not interested in the add-on module.

If you have any thoughts, feel free to jot them down on the enclosed questionnaire and we will make sure the Bally representatives see them. Thank you for your cooperation and we sincerely appreciate your patience.

Sincerely,

JS&A NATIONAL SALES GROUP

William Mitchell
Group Marketing Director

PROJECTS known to be in work include:
- a breakdown of the cassette interface circuit board and chip data. an understanding of this circuit will make it possible to construct a telephone modem.
- half-size lettering on the screen.
- 3-voice music
- effort to include decimal notation in the TBASIC
- a read-out of the information on the game cartridges

INSIDES of the TBASIC are becoming visible. Three known control characters are the @ & and %
   % is the PEEK command - this is being worked on now, more later
   @ gives string constants. Try this program

```
10 CLEAR
20 A=0
30 TV=A
40 @(A=A
50 PRINT "A"
60 A=A+1
70 GOTO 30
```

You will get a bunch of ??? as A progresses from 0 to about 26. Then from there to about 120 you will get the character, then???to cycle until 874 is reached. But one member writes that he has 887 strings.

   & does all kinds of things. I am going to duplicate parts of a letter just received that has a few things to keep you busy for a while...

MEANWHILE, here are some questions/answers
- Can I add an IBM-compatible floppy disc system? All I know is that Bally has a floppy disc prototype that was seen with the Add-On
- Is this computer S-100 compatible? No, it is supposed to be IEEE.
- Does the cassette come with the computer? No, the arrangements differ, as follows: With Tiny BASIC, you buy the #6002 TinyBASIC cartridge that plugs into the game slot.The machine is now self-contained. To add storage, buy a #10 INTF cassette interface that plugs into the right-most hand controller connector and the lightpen power plug. It also plugs into your portable recorder (or buy a #M2522) List prices of these are 49.95,49.95,and 55. as of this date. With the Add-On, the cassette interface will be built in, and then you just plug in your own player.
- WHICH reminds me that BALLY has told me that the problem I had written about last time, where I was having difficulty loading a tape made on one recorder through a different recorder, has been fixed, and all interfaces should work with 99% of recorders.
- Does graphics use SET (x,y) or a PRINT statement? There are two commands, LINE and BOX. LINE X,Y draws a line from where you are to the new point x,y. You can draw a line in white,black, none (just to move the cursor), and reverse (where the line is black or white depending on what the background is). The center of the screen is 0,0 with four quadrants. The x dimension is from -80 to 79, while y is from -44 to 43.   BOX draws a square or rectangular box around a point, with the same color arrangements.
- Does the original unit have any cassette WRITE ability? No, the TinyBASIC provides the access through the :INPUT command.

EXCERPTS included herein identify some areas of research that any of us can do at our TinyBASICS. Try everything and if youget different responses, let us know. I'd appreciate everything of this nature to be typed or neatly printed so that direct reproduction is possible. Also, I may eventually go to a reduced size, such as the included letters. Any comment?

THANKS for your support. The subscription sheet is enclosed this time.

```
10 For A=0to174
20 &(10)=A
30 Next A
```

List it a couple of times to fill the screen with words, run it, watch the words
disappear and then from top to bottom uncover one-half a pixel at a time!! Put
in a timer loop to slow the action down. A great tool for games where one can
squeeze the trigger of the hand controller and the screen will blank out or
rotate the knob and turn the screen on or off in layers.

I had a couple of professional programmers from the University where I work stop
by yesterday to look at the Bally and TB and they were intrigued by the above.
They had both seen TB at the computer faire in Anaheim earlier this year and were
very impressed by the power and potential of the Bally. Anyhow, it wasn't long
until they got into the more serious side of &(n)=n statements. For instance,
they found that the keyboard is configured as follows:

Try this :

10 PRINT &(23)

20 GOTO 10

& run the program.

In turn press each
key in the left hand
row and see the
appropriate #'s appear.

23	22	21	20
1	1	1	1
2	2	2	2
4	4	4	4
8	8	8	8
16	16	16	16
32	32	32	32

$\&(M)=N$ appears to set output
decimal port #M to the value of N
and
$N=\&(M)$ appears to read the
value of the M input port into the
variable N.

So, &(23)=1 if the "GO" key is depressed and &(20)=32 if the "WORDS" key is depressed.

They also discovered that &(k)=n where k is 28 for knob on controller 1
                                            29 for knob on controller 2
                                            30 for knob on controller 3
                                            31 for knob on controller 4
and that n is from 0 (clockwise) to 255 (counterclockwise).

Joystick and trigger use &(j)=n where j is 16 for joystick 1
use this program for checking out your   17 for joystick 2
controller operation to see that it   18 for joystick 3
functions in all positions.   19 for joystick 4
n is 1 for up
     2 for down   — more
     4 for left
     8 for right

10 &(16)=5x(1)
20 PRINT &(16)
30 GOTO 10
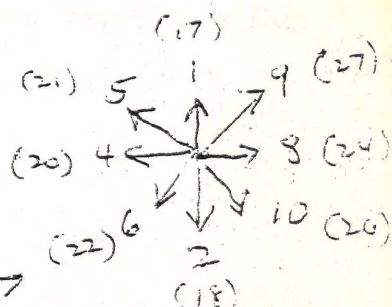
and 16 for trigger pulled.   Pull of Trigger #'s in ( )
                             + mixed joystick combination

Personally, I don't know what to do with the above information because TB has
built in all the capabilities I can think of for applications. Someone, somewhere
will think up uses for it, however, so I hope they will let us know.

If one wants to produce weird sounds or the equivalent of multiple notes use the instruction &(20)=n If n is equal to 0 or 64 or 128 or 192 or 256 the note is the note that is usually heard when reset is pushed. So, if you have a few minutes key in this program, run it and pick out a sound you would like to use in a program for special effects.

```
10 NT=50        (slow it down so you can hear what's happening)
20 FOR A= 0 TO 256
30 &(20)=A
40 Print "A"            (play something)
50 NEXT A
```

The basic note stays throughout the program but the supplemental notes vary in effects. All start at the lowest position of the 64 note chromatic scale and go to the highest.

&(8)=n causes the screen to blank out and wipes out any program.

&(9)=0to39 changes the screen to black and uncovers the screen from left to right 4 pixels at a time.

&(13)=n does lots of strange things all of them causing program loss, most of them freezing action but some of them displaying a screen full of images such as memory and some delete the cursor some leave the cursor displayed. 24 turns the screen black and a couple displayed the word *OVERFLOW* from the calculator function.

&(18)=n gives more variations of musical tones.

&(19)=n ditto on musical tones.

&(21)=n causes the volume of tones to increase for 16 n's and then drop back to normal level.

I don't know whether all basic units react the same way to all the commands because in &(13)=n I couldn't get them all to react the same way two days in a row.

Number 3 hand control plug-in is on the extreme right. For some reason Bally numbered them, left to right from the front of the machine.

<div align="center">

1   2   4   3

</div>

<div align="center">

Good Luck !

</div>

Bob Fabris   408-272-2364 home
3626 Morrie Dr.   742-6048 work
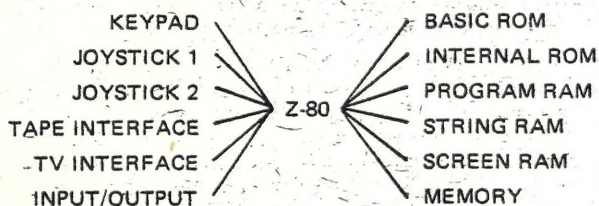San Jose,CA,95127

DATAFILE

The Bally Professional Arcade has transcended the barrier between the programmed computer game to a user programmed computer system. The transformation comes about when you insert the Bally BASIC ROM cartridge and press RESET. With the aid of a keyboard overlay card, the 24-key keypad is transformed into a full alpha-numeric keyboard with four "shift" keys to allow you to program in an enhanced version of Palo Alto Tiny BASIC. By forgetting that you ever used a regular keyboard, you can learn to type programs in BASIC fairly quickly due to the fact that the keyboard overlay is arranged in a logical manner.

The keyboard not only allows you to program letters, numbers and special symbols but it gives you the capability to use the WORD shift key to enter an entire BASIC command in one keystroke.

Bally BASIC is designed to work with the various elements of the Arcade to give as much control as possible over the TV screen and speaker (for music) while allowing you to input from either the built-in keypad or two joysticks. Here is a block diagram to give you an idea of the elements making up the Bally Professional Arcade with Bally BASIC:

```
KEYPAD              BASIC ROM
JOYSTICK 1          INTERNAL ROM
JOYSTICK 2    Z-80  PROGRAM RAM
TAPE INTERFACE      STRING RAM
TV INTERFACE        SCREEN RAM
INPUT/OUTPUT        MEMORY
```

Let's take a look at the Input/Output (I/O) side of the diagram first. The 24-key keypad has four shift keys to produce 93 possible codes to be entered from this input device. Each shift key is color-coded on the overlay and the background color of the screen changes to match this color when the shift key is pressed. The keypad can be interrogated with a special variable (KP) during the execution of a BASIC program.

Two joysticks are able to input to a BASIC program in three ways: TR(1) is the variable attached to the trigger on the number one joystick. This variable is equal to zero until the trigger is pulled when it is equal to one. The joystick itself has two variables associated with it: JX(1) and JY(1). Both variables are equal to zero until the joystick is moved. Here is how these variables change with the position of the joystick:

$$JY(1)=1$$
$$JX(1)=-1 \quad 0 \quad JX(1)=1$$
$$JY(1)=-1$$

By combining the information read from JX and JY, you can resolve eight separate joystick positions (eg. JX=1, JY=-1 would be the Southeast direction).

The third and most versatile input is the knob on the end of the joystick which goes by the variable name, KN(1). KN(1) uses the analog to digital circuits in the Arcade to give you numbers between -128 and +127. This can be used to vary colors, position or sound easily and with accuracy.

The optional Bally BASIC cassette interface allows you to store and retrieve programs (but not strings) using a standard tape recorder with earphone and microphone jacks. The format used is the Kansas City Standard which runs at 300 baud. The interface plugs into the jack normally used for joystick number three when you are playing the Arcade games and it gets power from the jack provided for the future light pen option. In operation, an LED tells you when the signal is present before the loading starts. When the program loads, it also lists on the screen to let you see what is loading and if it is loading correctly. There is even a command to read information from the tape directly to the TV screen without disturbing memory so that you can verify that the program was recorded correctly or so that you can find a blank spot on a tape to save your program.

The TV interface is the output section for the Bally Arcade; it allows color graphics, text and musical tones to be controlled from your program. The foreground and the background colors are controlled by the variables FC and BC and there are 256 colors available for each. The restriction is that only two colors may be on the screen at one time in Bally BASIC as opposed to the 8 colors available simultaneously in the Arcade games. Text is read onto the screen with the PRINT command or the TV variable which will be explained later. Music is also obtained from the PRINT command since each character has a note associated with it. MU is a special variable which plays music without printing on the screen.

The cursor (a moving block which acts as a screen pointer) can be positioned with two more special variables: CX and CY. By setting these variables equal to the desired coordinates on the screen, you can make the cursor appear wherever you want it to allow you to print text at that location. These two variables may also be used to tell you where the cursor is at any time by simply reading them (ie. PRINT CX, CY).

Now that you've seen the hardware side of the Bally Professional Arcade, the input and output devices, let's take a look at the insides which include the memory circuits and their contents, the software.

The memory "space" in the Bally Professional Arcade is determined by the microprocessor within the unit, the Z-80. The normal amount of memory which can be handled by a Z-80 is 65,636 bytes (a single character takes up one byte which is 8 bits). In the Arcade, this memory space is divided into ROM memory which is set up at the factory for a certain program and RAM memory which stores your information whether it is the program you write, the music you compose or the shapes you create on the TV screen. The full range of the Z-80 microprocessor will not be used until the expansion unit becomes available with its own RAM and ROM but the Bally BASIC system is impressive when you weigh its capability against that of anything near its price.

✳   My unit works only when plugged into the extreme right connector.

The ROM in the Bally Professional Arcade is primarily dedicated to the three games and calculator programs but it also contains the operating system to allow the screen to display shapes and colors as well as play notes through the speaker. The ROM cassettes from Bally plug into the unit and attach to the Z-80 memory bus with a connector inside. These cassettes may contain games or, in this instance, Bally BASIC.

When you plug in the Bally BASIC cassette, the ROM inside takes control of the hardware in the system to allow you to enter your own programs for games or educational purposes. Because the Arcade cannot attach to a printer or other hard copy device and because this version of Tiny BASIC has no floating point (decimal) numbers, it is not well suited to business use. The Bally expansion unit will serve this type of application at a later date.

The RAM is normally dedicated solely to the TV interface so that it can display 8 colors at once with high-resolution graphics to simulate real-world situations such as a car driving down a road or a baseball field complete with players. When the BASIC ROM is plugged in, the 4096 bytes of RAM are subdivided into three sections: program, string and screen. The trade-off is that you can only display two colors at once but you gain 1800 bytes of memory in which to store your program, and you can store up to 874 numbers in the numeric string memory (this is where you store the notes for your piano player program).

Learning Bally BASIC is not hard; most of the commands are the same as you find in any computer's BASIC, but there are four new commands which provide new operations which most computers have no way to duplicate. The standard BASIC commands available are:

FOR, TO, NEXT, STEP, GOTO, GOSUB, RETURN, INPUT, RND, LIST, IF (no THEN)

Bally set up the following special purpose commands for you to use:

PRINT — This command operates in the normal way except that as each letter or number is placed on the screen, it plays a note whose duration is determined by the note time variable NT. NT=0 turns off this music feature. PRINT #A, B will print A spaces before it prints the numeric value of B to provide formatting capability.

BOX — BOX X, Y, A, B, C prints a box on the screen centered at location X, Y with height A and width B screen units (pixels). The fifth parameter, C, gives you control over how the box affects the screen. 1 = foreground color, 2 = background color, 3 = foreground color but reverse images inside the box, 4 = no box (good for moving over images without disturbing them). The screen has 13,833 separate pixels arranged 159 wide and 87 high.

LINE — LINE X, Y, C draws a line from the end of the last line (or 0, 0 which is the origin or center of the screen) to the pixel at location X, Y. The third parameter C is the same as the fifth parameter C for the BOX command. Both BOX and LINE commands operate fairly quickly.

CLEAR — This command simply clears the screen for more graphics to be displayed or text to be printed.

Another interesting special variable, PX (X, Y) allows you to check the pixel at location X, Y to determine whether it is currently set to the foreground color (1) or the background color (0). This is useful if you are moving something on the screen and you want to check for a barrier, etc.

When using the screen for text, the display consists of 11 lines of 26 characters each. A program line can extend over four screen lines for a total of 104 characters. Statements may be separated by a semicolon on the same program line. Integers from -32767 to +32767 may be used.

Three error messages are issued by Bally BASIC:

WHAT? — This is the syntax error message which tells you when the computer doesn't understand your statement.

HOW? — This message tells you that the computer knows how to perform the command but doesn't have the resources available.

SORRY! — Out of memory. You can check the amount of unused memory with the special variable SZ to prevent this problem.

Bally BASIC uses the term "string" to refer to a single-dimensioned subscripted variable which is used only to store numbers during program execution. 874 of these strings are packed into a separate memory from the program so that you don't have to worry about leaving space for these strings when you write your program. There is one way to get alpha characters from a string, and that is using the special variable TV. When you set TV equal to a number between 30 and 139, you are able to access most of the keys on the keyboard to print their corresponding words, numbers, letters or symbols wherever the cursor is located.

The immediate functions available include GO which serves as a return key plus it can generate a new line number ten higher by preceding it with the WORD shift. HALT halts program execution while PAUSE is a temporary delay until another key is pressed to resume execution. An ERASE key is provided to allow you to backspace for corrections.

To give you an idea of how many lines you can fit into 1800 bytes, this line could be entered 138 times before the Bally BASIC said "SORRY":

20000 CLEAR; INPUT X, LINE X, 9, 4

A key command takes up one byte as does each separate character. A line number occupies three bytes of program RAM but the strings have their own memory to keep from interfering with the program.

As you can see, it is the special variables, music and graphics commands which make Bally BASIC a powerful tool to use the Arcade's capabilities. This, along with the low price of less than $350, makes for a perfect system to get a start in programming microcomputers as well as to give you a reason to turn off those boring network shows and do something creative with your TV.

Next installment will include an interesting sample program with a lot of remarks and comments concerning its operation.